s18quiz: EXP LOG (SLTN v248)
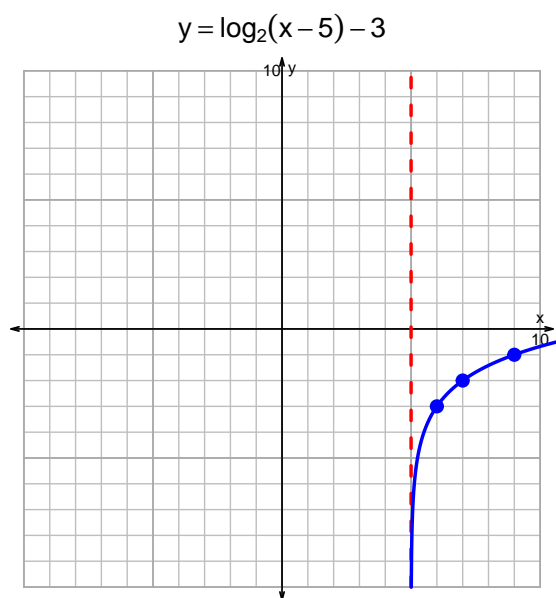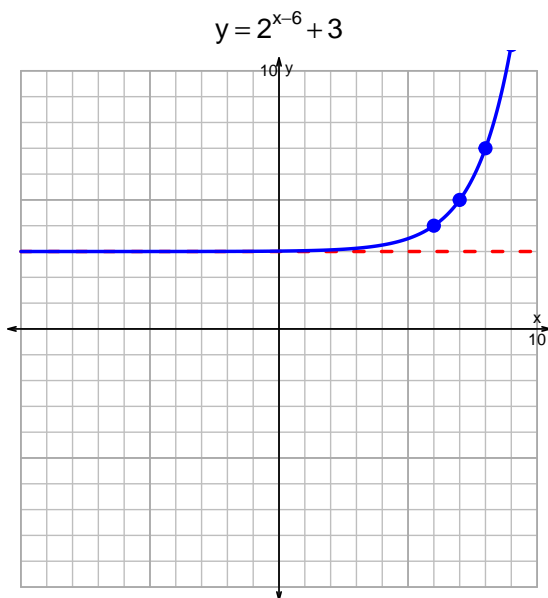
1. Graph $y = 2^{x-6} + 3$ and $y = \log_2(x-5) - 3$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = 2^{x-6} + 3$$

$$y = \log_2(x-5) - 3$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$23 = \left(\frac{3}{4}\right) \cdot 10^{-5t/7}$$

Divide both sides by $\frac{3}{4}$.

$$\frac{23 \cdot 4}{3} = 10^{-5t/7}$$

Take log, base 10, of both sides.

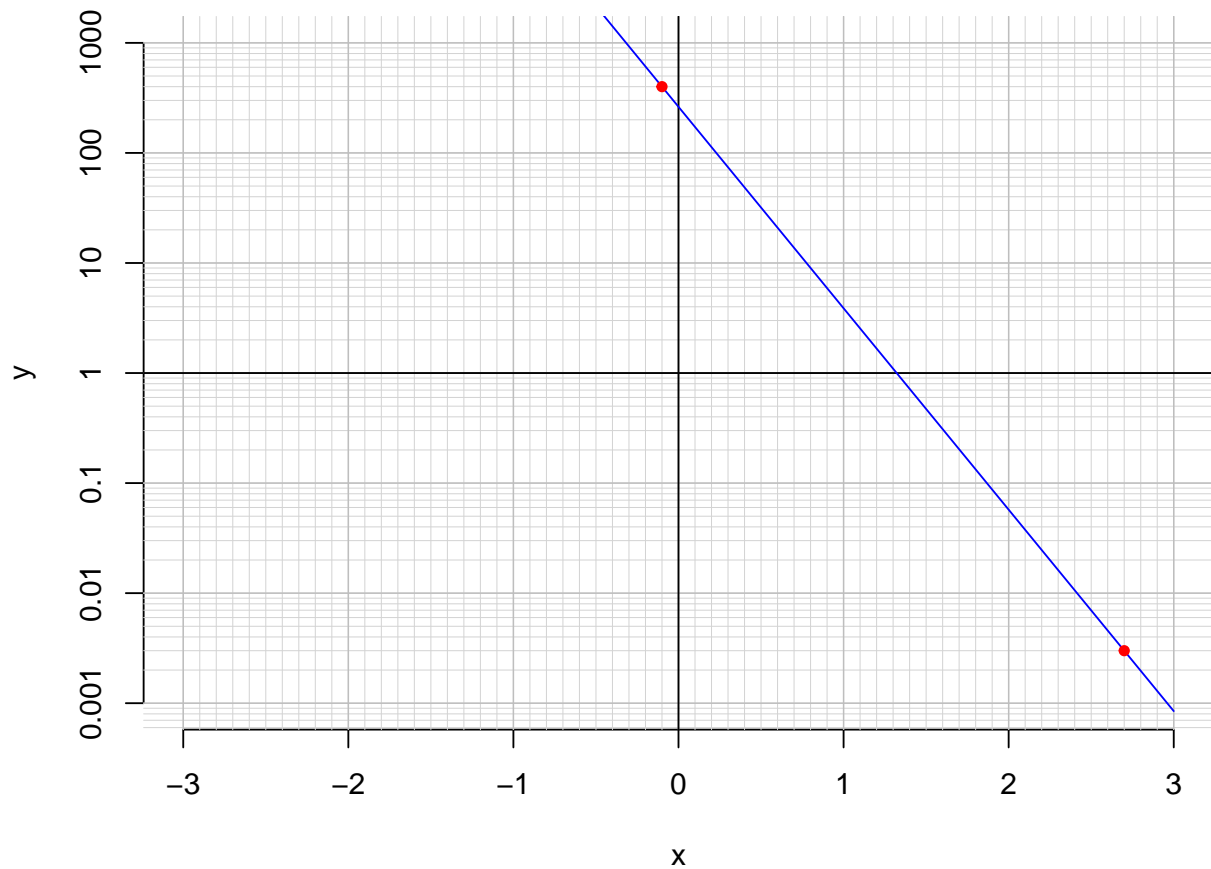$$\log_{10}\left(\frac{23 \cdot 4}{3}\right) = \frac{-5t}{7}$$

Divide both sides by $\frac{-5}{7}$.

$$\frac{-7}{5} \cdot \log_{10}\left(\frac{23 \cdot 4}{3}\right) = t$$

Switch sides.

$$t = \frac{-7}{5} \cdot \log_{10}\left(\frac{23 \cdot 4}{3}\right)$$

3. An exponential function $f(x) = 262 \cdot e^{-4.21x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(2.7)$.

$$f(2.7) = 0.003$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{4.21} \cdot \ln\left(\frac{x}{262}\right)$$

c. Using the plot above, evaluate $f^{-1}(400)$.

$$f^{-1}(400) = -0.1$$